



ProLiant ML350 Generation 2 Server

Setup and Installation Guide

Second Edition (October 2001)
Part Number 236843-002
Compaq Computer Corporation

Notice

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About This Guide

This guide is designed to be used as a set of step-by-step instructions for the installation of Compaq ProLiant ML350 Generation 2 servers and as a reference for operation, troubleshooting, and future upgrades of the server.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
<i>FILENAMES</i>	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters and may appear in bold for emphasis.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase and may appear in bold for emphasis.
Type	When you are instructed to <i>type</i> information, type the information without pressing the Enter key.
Enter	When you are instructed to <i>enter</i> information, type the information, and then press the Enter key.
Websites	Unless otherwise noted within the body of this guide, all URLs begin with the http:// default prefix.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:



This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user- or field-serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.



This symbol on an RJ-45 receptacle indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.



These symbols, on power supplies or systems, indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg **WARNING:** To reduce the risk of personal injury or damage to the
Weight in lb equipment, observe local occupational health and safety requirements and
guidelines for manual material handling.

Rack Stability



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

Important Safety Information

Before installing this product, read the *Important Safety Information* document, provided if applicable.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Technical Support

In North America, call the Compaq Technical Support Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet at

www.compaq.com

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

Compaq Website

The Compaq website has information on this product as well as the latest drivers and flash ROM images. You can access the Compaq website by logging on to the Internet at

www.compaq.com

Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers.

Chapter 1

Server Features

The Compaq *ProLiant*™ ML350 Generation 2 server delivers the latest performance features at a very competitive price. Whether deployed in a workgroup setting within a large corporation or as the primary server in a small-to-medium business, the ProLiant ML350 Generation 2 server is an ideal server for applications such as file and print services, shared Internet access, and small databases. This server delivers Intel Pentium III technology, error checking and correcting (ECC) memory, easy expandability, and leading server management tools such as *Compaq Insight Manager*™ software and ROM Based Setup Utility (RBSU).

Server features include:

- Intel Pentium III processor with 133-MHz system bus
- Dual-processor capability
- 133-MHz Registered ECC synchronous dynamic random access memory (SDRAM) DIMMs, upgradable to 4 GB
- Capacity for six 1-inch hot-plug hard drives in the hard drive cage
- Four removable media bays (two available)
- Integrated dual channel Wide Ultra3 SCSI Controller
- Integrated Compaq Fast Ethernet NIC 10/100 Auto Switching Network Controller
- Five 64-bit PCI slots and one 32-bit PCI slot (all 33-MHz)
- IDE CD-ROM drive
- 350-watt optionally redundant power supply
- Diskette drive
- Video controller
- Tower and rack form factors

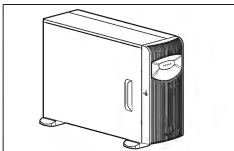


Figure 1-1. ProLiant ML350 Generation 2 tower server

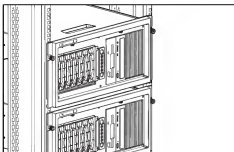


Figure 1-2. ProLiant ML350 Generation 2 rack server

Standard Hardware Features

The following hardware features are standard on the ProLiant ML350 Generation 2 server, unless otherwise noted.

Tower Server Front Panel Components and Drive Bay Dimensions

The ProLiant ML350 Generation 2 server supports a maximum of ten internal drives (four are intended for removable media drives and six are for hard drives). Figure 1-3 shows the front panel components and Table 1-1 shows the drive dimensions of the ProLiant ML350 Generation 2 server.

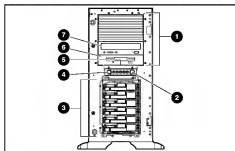


Figure 1-3. Identifying front panel components with bezel removed (tower)

Table 1-1
Tower Server Front Panel Components with Drive Bay Dimensions

Item	Component	Dimensions
	Removable media bays	5.25 in x 1.60 in
	Power button	N/A
	Hard drive bays	3.5 in x 1.0 in
	Unit ID button	N/A
	LEDs	N/A
	Diskette drive	3.5 in x 1.0 in
	CD-ROM drive	5.25 in x 1.60 in

Rack Server Front Panel Components and Drive Bay Dimensions

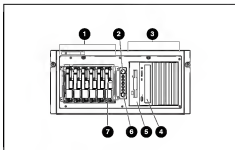


Figure 1-4. Identifying front panel components (rack)

Table 1-2
Rack Server Front Panel Components with Drive Bay Dimensions

Item	Component	Dimensions
	Hard drive bays	3.5 in x 1.0 in
	Unit ID button	N/A
	Removable media bays	5.25 in x 1.60 in
	CD-ROM drive	5.25 in x 1.60 in
	Diskette drive	3.5 in x 1.0 in
	Power button	N/A
	LEDs	N/A

Tower Server Rear Panel Components



WARNING: This equipment is designed for connection to a grounded (earthed) outlet. The grounding-type plug is an important safety feature. To reduce the risk of electric shock or damage to your equipment, do not disable this feature.

Figure 1-5 and Table 1-3 show the connectors on the rear panel of the ProLiant ML350 Generation 2 server.

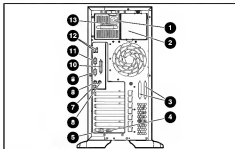


Figure 1-5. Identifying rear panel components

Table 1-3
Rear Panel Components

Item	Component	Item	Component
	Power cord connector		Keyboard connector
	Optional redundant power supply bay		Serial port B connector
	SCSI connector knockouts		Parallel port connector
	Video connector		Serial Port A connector
	RJ-45 Ethernet connector		USB ports
	Mouse connector		Power supply LED
	Unit ID LED/button		

Rack Server Rear Panel Components

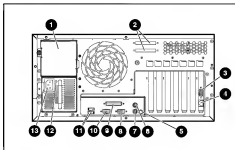


Figure 1-6. Identifying rear panel components (rack)

Table 1-4
Rear Panel Components

Item	Component	Item	Component
	Optional redundant power supply bay		Serial port B connector
	SCSI connector knockouts		Parallel port connector
	Video connector		Serial port A connector
	RJ-45 Ethernet connector		USB ports
	Unit ID LED/button		Power supply LED
	Mouse connector		Power cord connector
	Keyboard connector		

System Board Components

Figure 1-7 and Table 1-5 show the components and connectors on the system board of the ProLiant ML350 Generation 2 server.

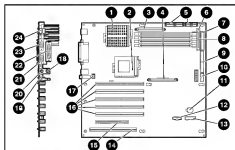


Figure 1-7. Identifying system board components

Table 1-5
System Board Components

Item	Component	Item	Component
	Processor socket 1		Remote Insight Connector (16-pin)
	Processor socket 2		Server Feature Board connector
	Processor Power Module 1		32-bit PCI slot
	Processor Power Module 2		64-bit PCI slots
	Power supply connectors		System fan connector
	Secondary IDE connector		Mouse connector
	Diskette drive connector		Unit ID LED/button
	DIMM slots		Keyboard connector
	Primary IDE connector		Serial port B connector
	Power button connector		Parallel port connector
	Battery		Serial port A connector
	Remote Insight Connector (32-pin)		USB ports
Note: For information on system board LEDs, refer to Appendix E, "LED Indicators, Switches, and Jumpers."			

LEDs and Buttons

Figure 1-8 shows the LEDs and buttons on the front panel of the server.

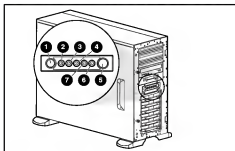


Figure 1-8. Front panel LEDs and buttons

Table 1-6
Front Panel LEDs and Buttons

Item	LED/Button
	Unit ID button
	Unit ID LED
	Internal health LED
	External health LED
	Power button
	Power LED
	NIC activity LED

Processors and System Memory

- Pentium III processor with integrated 512-KB Level 2 Advanced Transfer Cache and dual-processor capability
- Error checking and correcting (ECC) for memory error detection and correction
- 133-MHz Registered ECC synchronous dynamic random access memory (SDRAM) DIMMs, upgradable to 4 GB
- Support for up to four PC 133-MHz Registered ECC SDRAM DIMMs
- DIMMs may be installed one at a time

Expansion Slots

- Six expansion slots: five 64-bit PCI slots and one 32-bit PCI slot
- PCI bus that provides peripheral transactions at a bus clock speed of up to 33 MHz
- 3.3-volt compatible (5-volt compatible on the 32-bit PCI slot)

Storage Controller

- Integrated dual-channel Wide Ultra3 SCSI controller on the PCI local bus. The controller provides either two internal SCSI buses, two external SCSI buses, or one internal and one external SCSI bus. This controller performs at a maximum data transfer rate of 160 MBps.
- Optional controller boards for RAID support, controller duplexing or expanding available storage capacity.

Network Interface Controller

- Integrated Compaq Fast Ethernet 10/100 Autoswitching network interface controller (NIC).
- The Embedded NIC Port 1 PXE Support options allow the server to boot to the network and attach to a PXE server with boot images. When enabled, the NIC port is displayed in the initial program load (IPL) list.

Ports and Connectors

- Serial (2)
- Parallel
- Keyboard
- Mouse
- USB (2)

Power Supply

- CE Mark-compliant 350-watt optionally redundant 1+1 hot-plug power supply with power factor correction and auto switching

Server Feature Board Components

Figure 1-9 and Table 1-7 show the components of the ProLiant ML350 Generation 2 Server Feature Board.

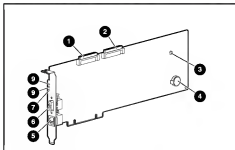


Figure 1-9. Identifying Server Feature Board components

Table 1-7
Server Feature Board Components

Item	Component	Item	Component
	SCSI controller channel B		Video connector
	SCSI controller channel A		Network speed LED
	NMI button		Network link LED
	Replaceable lithium battery (CR2032)		Network activity LED
	RJ-45 Ethernet connector for NIC		

Note: For LED status information, refer to Appendix E, "LED Indicators, Switches, and Jumpers."

Interfaces

- Integrated Dual Channel Wide Ultra3 SCSI Controller
- Integrated Compaq Fast Ethernet 10/100 Autoswitching Network Interface Card (NIC)

Video

- Integrated ATI Rage XL Video Controller providing maximum resolution of 1280 x 1024 noninterlaced at 16.7 million colors
- Supports SVGA, VGA, and EGA graphics resolution
- 8-MB SDRAM video memory

Warranty

The Compaq Prefailure Warranty helps prevent unplanned shutdowns of the system by allowing for the replacement of covered parts before they fail. The warranty covers processors, memory, and hard drives. Compaq Insight Manager, included with the system, must be installed for the Compaq Prefailure Warranty to be in effect.

When Compaq Insight Manager alerts you that a component may be eligible for Prefailure Warranty replacement, follow the onscreen instructions or contact a Compaq authorized service provider in your area. A yellow status indicator on the Compaq Insight Manager control panel signals that a component is in a prefailure condition and should be replaced.

Consult the Compaq Customer Support Center or refer to the Limited Warranty Statement included with your server for details. Certain restrictions and exclusions apply. For additional warranty information, visit the Compaq website at

www.compaq.com/support/

Server Configuration and Management

The ProLiant ML350 Generation 2 server offers an extensive set of features and optional tools to support effective server management and configuration, including:

- **ROM Based Setup Utility (RBSU)**—performs a wide range of system configuration activities
- **ROMPaq™** utility—allows the firmware (BIOS) to be upgraded by flashing the system ROM and provides redundant ROM support in case of ROM corruption
- **Compaq SmartStart™ for Servers** software—provides driver updates and assisted operating system installation
- **Compaq Insight Manager**—monitors fault conditions, server performance, security, and more
- **Compaq Diagnostics Utility**—tests and verifies the operation of Compaq hardware
- **Automatic Server Recovery-2 (ASR-2)**—increases server up time in the event of a catastrophic operating system error
- **Compaq Survey Utility**—allows you to keep a historical record of server hardware and software changes in a single configuration history file
- **Power-On Self-Test**—checks firmware and assemblies to ensure that the system is properly functioning

See Chapter 5, “Server Configuration and Utilities,” for detailed information on each of these utilities.

Security

Security features include:

- Setup Password
- Power-on Password
- Diskette Drive Control
- Diskette Write Control
- Diskette Boot Override
- Serial Interface Control
- CD Boot Override
- Parallel Interface Control
- Power Switch Protection
- Bezel Lock

Most security features are established through RBSU. For detailed information on RBSU, see Chapter 5, "Server Configuration and Utilities," or see the *Compaq ROM Based Setup Utility User Guide*. For additional information concerning server security features, refer to the SmartStart for Servers CD included in the shipping box.

Overview of Server Installation

The following instructions are provided as an overview for first-time installation of your Compaq ProLiant ML350 Generation 2 server.



WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.



CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge (ESD)," for more information.

Selecting a Site

Make sure that the installation area that you select has the following features:

- A sturdy, level installation site that includes dedicated and properly grounded (earthed) circuits, air conditioning, and electrostatic discharge (ESD) protection
- 7.6 cm (3.0 inches) clearance on all sides of server for proper ventilation in a tower configuration

IMPORTANT: See the following section, "Installing the Rack Server," for clearance specifications if you are installing the ProLiant ML350 Generation 2 server into a rack configuration.

- A separate electrical circuit for the server



CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

To purchase a UPS, contact your local Compaq authorized reseller or visit the Compaq website:

www.compaq.com/showroom/

Refer to Appendix F, "Specifications," for detailed power and environmental site requirements.

Installing the Rack Server

The ProLiant ML350 Generation 2 server is also available in a rack model, immediately ready for installation. A rack conversion option kit is also available for customers who want to convert a tower ProLiant ML350 Generation 2 server to a rack server. This section provides environmental information required for the installation of a rack-mounted server.

Tower-to-Rack Option

Figure 2-1 shows the ProLiant ML350 Generation 2 server installed in a rack configuration.

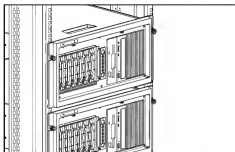


Figure 2-1. The ProLiant ML350 Generation 2 server installed in a rack

To purchase the rack conversion kit (Part Number 237045-B21), contact your local Compaq authorized reseller or order direct from Compaq.

A selection of racks for your server can be purchased through your Compaq authorized reseller or direct from Compaq at

www.compaq.com/storage/

Rack Environment

To allow for servicing and adequate airflow, observe the following spatial requirements when selecting a site for your rack-mounted server:

- Leave a minimum clearance of 63.5 cm (25.0 inches) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30.0 inches) behind the rack.
- Leave a minimum clearance of 121.9 cm (48.0 inches) from the back of the rack to the back of another rack or row of racks.

Compaq servers draw in cool air through the front door of the rack and expel warm air through the rear door. Therefore, the front door must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.

IMPORTANT: Do not block the ventilation openings.

When there is any vertical space in the rack not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow.



CAUTION: Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

Compaq 9000 Series racks provide proper server cooling from flow-through perforations in the front and rear doors that provide 64 percent open area for ventilation. Refer to the rack documentation provided with Compaq 7000 Series racks for guidelines on meeting airflow requirements.



CAUTION: When using a Compaq 7000 Series rack, you must install the high-airflow rack door insert (Part Number 327281-B21 (42U) and Part Number 157847-B21 (22U)) to provide proper front-to-back airflow and cooling to prevent damage to the equipment.

Locating Materials

Locate the following materials that were shipped with your ProLiant ML350 Generation 2 server:

- Keyboard (not included with the rack model)
- Mouse (not included with the rack model)
- Power cord
- Documentation and software packs inside the shipping box

In addition to these supplied items, you may need:

- Torx T-15 screwdriver
- Phillips #2 screwdriver
- Hardware options
- Ethernet cable
- Operating system or application software
- Uninterruptible power supply (UPS)
- Monitor

Installation Sequence

Observe the following statements before beginning any installation procedures.



WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.



CAUTION: If your server has a preinstalled operating system, prevent data loss by configuring the server using the instructions in the following section, "Factory-Installed Operating Systems." If the operating system was not preinstalled, follow the instructions in the "Operating System Purchased Separately" section later in this chapter.



CAUTION: Before powering up the server, make sure that the power cord and all cables have been properly connected or server data could be lost.

Factory-Installed Operating Systems

If you ordered your server with a preinstalled operating system, everything required to install your operating system is already on the server. Refer to the steps provided in the *Compaq Factory-Installed Operating System Software User Guide* for more information on using your operating system.

1. Review and follow the guidelines and procedures in the previous sections of this chapter.
2. Connect the cables: keyboard, mouse, monitor, network, and power. See the section for tower server or rack server rear panel components in Chapter 1, "Server Features."



WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacle.

3. Locate the key and unlock the front bezel if necessary.

NOTE: A key hook is located inside the front bezel above the keylock latch. For your convenience, you may use the key hook to store the key when it is not needed.

4. Power up the server by opening the front bezel and pressing the power button on the front of the server .

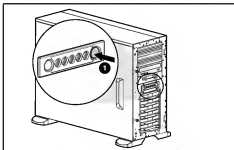


Figure 2-2. Powering up the server (bezel removed for clarity)

5. Follow the onscreen instructions to complete the preinstalled operating system initialization process. After initialization is complete, the server automatically goes through Power-on Self-Test (POST).
6. To manage the server, install Compaq Insight Manager, found on the Compaq Management CD. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq prefailure warranties on processors, hard drives, and memory modules.

7. After verifying your server configuration, back up your system configuration. Refer to the SmartStart for Servers CD for further information on backing up your system configuration.
8. Install any additional hardware. See Chapter 3, "Hardware Options Installation," or the option kits, for detailed instructions on installing internal hardware.
9. Install any application software.
10. Register your server. See the "Server Registration" section later in this chapter for details.

This procedure completes the installation.

Operating System Purchased Separately

If you purchased your operating system separately, install it using the SmartStart for Servers CD. Refer to the Server Setup and Management pack for instructions on using SmartStart. The first time the server is configured, the SmartStart program automatically creates a necessary partition on your hard drive. This partition cannot be used for any other purpose and is not a traditional system partition.

Follow this sequence when installing your operating system for the first time:

1. Review all guidelines listed from the beginning of this chapter through the "Locating Materials" section.
2. Install any hardware options if needed. See Chapter 3, "Hardware Options Installation," or see the options kits for detailed installation instructions.



WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacle.

3. Connect cables: keyboard, mouse, monitor, network, and power. See rear panel components section applicable to your tower or rack server in chapter 1 of this guide.
4. Locate the key and unlock the front bezel if necessary.

NOTE: A key hook is located inside the front bezel above the keylock latch. For your convenience, you may use the key hook to store the key when it is not needed.

5. Power up your server by pressing the power button on the front of the server.
6. Configure your server. See "Configuring the Server" later in this chapter for instructions.
7. Install the operating system.
8. Install Compaq Insight Manager to manage the server. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq Pro-Failure Warranties on processors, hard drives, and memory modules.

9. Install any application software needed.
10. Register your server. See "Server Registration" later in this chapter for details.

Configuring the Server

The server setup utility, RBSU, can be used to configure the server and options. To initiate RBSU, press the **F9** key when prompted during start up.

The SmartStart CD contains ROMPaq and updated drivers, and assists with operating system installation. To use the SmartStart CD:

1. Locate the SmartStart CD in the Server Setup and Management pack.
2. After you power up the server, press the CD-ROM drive eject button.
3. Insert the SmartStart CD into the CD-ROM drive with the labeled side up. Handle the CD by its edges, not by the flat surfaces of the disc.

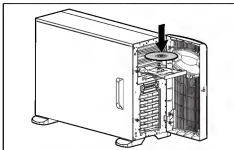


Figure 2-3. Inserting a CD into the CD-ROM drive

4. After the server boots to the CD, the SmartStart sequence begins. Refer to the SmartStart CD for more information.

Server Registration

For server registration information, refer to the Server Setup and Management pack shipped with the server, or visit the Compaq website:

www.compaq.com/register

Hardware Options Installation

This chapter provides procedures for installing, removing, and replacing hardware options in the Compaq ProLiant ML350 Generation 2 server.



CAUTION: Electrostatic discharge (ESD) can damage electronic components of the server. Before beginning any installation procedure, make sure that you are discharged of static electricity by briefly touching a grounded metal object.

Preparing the Server

Chassis Components

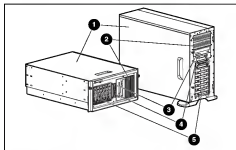


Figure 3-1. Identifying tower and rack chassis components

Table 3-1
Tower and Rack Chassis Components

Item	Description
	Access panel
	Removable media bays
	CD-ROM drive
	Diskette drive
	Hard drive bays

Powering Down the Server

Before installing or removing options, prepare your server by following these steps:



CAUTION: Failure to follow these directions could result in damage to equipment or loss of information.

1. Back up your server data and record configuration information.
2. Shut down the operating system (OS) as directed in your OS instructions.
3. Power down the server by pressing the power button on the front of the server.
4. Remove the power cord.



WARNING: To reduce the risk of injury from electric shock or damage to the equipment when installing an upgrade, make sure that the server is powered down. Remove all AC power cords to completely disconnect power from the system. The front panel power button may not completely shut down power to the server.

5. Disconnect any external equipment connections from the server.

Removing the Bezel

To remove the bezel:



CAUTION: To prevent damage to equipment or loss of data, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the bezel.

1. Follow the steps in "Powering Down the Server" earlier in this chapter.
2. If necessary, unlock the bezel using the included key .
3. Open the bezel fully to the right .

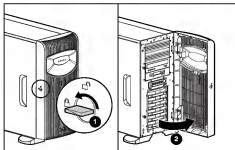


Figure 3-2. Unlocking the keylock and opening the bezel

4. To remove the bezel, lift the bezel upward, and pull it away from the chassis.

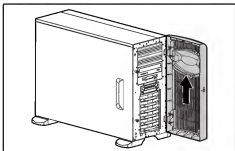


Figure 3-3. Removing the bezel

To replace the bezel, reverse the above procedure.

NOTE: When replacing the bezel, be sure that the bottom hinge points are properly placed in the chassis before rotating the bezel back into its original position.

Removing the Access Panel in a Tower Server

To remove the access panel:



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.



CAUTION: To prevent damage to equipment or loss of data, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.



CAUTION: Do not operate the server when the large access panel is removed. This panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

1. Remove the bezel by following the preceding steps.
2. Loosen the two thumbscrews located on the left side of the front chassis .
3. Slide the access panel back about 1.5 cm (0.5 in) .
4. Lift and remove the panel.

NOTE: Turn the access panel over to locate the System Configuration hood label. This label provides information on installing processor board options, configuring drives, installing drives, LED status indicators, and setting switches.

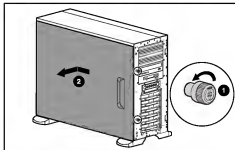


Figure 3-4. Loosening the thumbscrews and removing the access panel

To replace the access panel, reverse steps 1 through 4.

Removing the Access Panel in a Rack Server

To extend the server from the rack and remove the access panel:

1. Loosen the two thumbscrews that secure the chassis to the front of the rack .
2. Slide the server out from the rack until the sliding rails lock .

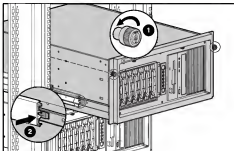


Figure 3-5. Sliding the server out of the rack

3. Loosen the two thumbscrews located at the top of the front chassis .
4. Slide the access panel back about 1.5 cm (0.5 in) .
5. Lift and remove the panel.

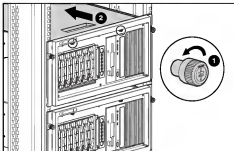


Figure 3-6. Removing the access panel (rack server)

Removing the Removable Media Device Blanks

NOTE: The blanks must be removed from the chassis to install a storage device in its place. The tray on the blank is used to mount non-hot plug hard drives into removable media device bays.

To remove a removable media device blank from the front chassis:



CAUTION: Before removing a removable media device blank, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in the section applicable to your tower or rack server earlier in this chapter.
2. Push up on the drivelock to release the blanks .
3. Gently pull the blank away from the front chassis, and then remove the blank .

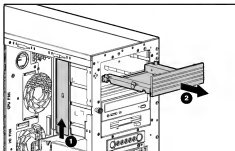


Figure 3-7. Removing a removable media device blank

NOTE: The interior of the server may look different depending on the model purchased.

To replace a removable media device blank, reverse steps 1 through 3.

Storage Devices

This section discusses removal and replacement procedures for the storage devices supported by the ProLiant ML350 Generation 2 server.

Before installing a device, see “Front Panel Components and Drive Bay Dimensions” in Chapter 1, “Server Features,” for the locations and dimensions of the server drive bays.



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel or front bezel.

IMPORTANT: When you add or remove a component or change a security feature, you must reconfigure the server to recognize these changes. If the system configuration is incorrect, your server may not work properly and you may receive error messages on the screen.

Identifying Guide Screws

When installing drives in the removable media bay, you must install guide screws to ensure that the drives correctly align in the drive cage. Compaq has provided extra guide screws. They are located behind the side access panel of the server. Some options use 5.25 M3 metric screws and some use HD 6-32 screws. The metric screws supplied by Compaq are black.

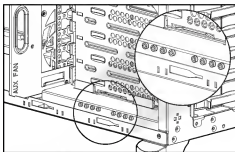


Figure 3-8. Identifying drive guide screws

NOTE: The interior of the server may look different depending on the model purchased.

Installation Guidelines for SCSI Hard Drives

Consider the following guidelines when installing SCSI hard drives:

- Install drives into the bays in the following order: 0, 1, 2, 3, 4, 5.
- Assign SCSI device IDs in the following order: 0, 1, 2, 3, 4, 5.

See Figure 3-9 and Chapter 4, “Cabling Guidelines,” for additional information.

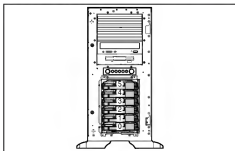


Figure 3-9. Hot-plug SCSI hard drive bay configuration

Installing and Removing a Hot-Plug Hard Drive

To install a hot-plug hard drive, first review the installation documentation that came with the drive.

1. Follow the steps in "Removing the Bezel" earlier in this chapter to access the hot-plug hard drive bays.
2. Slide the release latch and remove the hard drive blank .

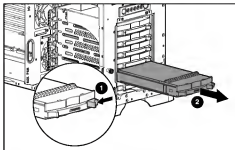


Figure 3-10. Removing the hard drive blank

3. Slide the hard drive release latch to open the ejector lever .

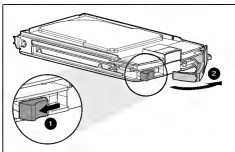


Figure 3-11. Opening the ejector lever

4. Insert the hot-plug hard drive into the lowest available hot-plug drive bay, and then close the ejector lever.

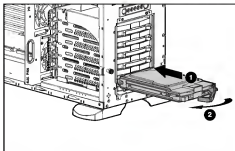


Figure 3-12. Inserting the hot-plug hard drive and closing the ejector lever

To remove a hot-plug hard drive, reverse steps 1 through 4.

IMPORTANT: A hard drive blank must be installed into any empty drive bay for the system to properly operate.

Installing a Device into a Removable Media Bay

The ProLiant Generation 2 server includes four removable media bays. The lower two bays are occupied with a 3.5-inch diskette drive and an IDE CD-ROM drive; the upper two removable media device bays are vacant. You can install two half-height devices or one full-height device into these bays.

IMPORTANT: You must set the SCSI device ID equal to the bay number. Select a unique SCSI device ID for each device. See Figure 3-9 for bay numbering.

Installing a Half-Height Removable Media Device

To install a 5.25-inch device:



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. To configure the device, set the SCSI ID. You must manually set the SCSI ID on each device to a unique value. Refer to the documentation provided with the device for instructions on setting the SCSI ID.
3. Remove all terminating jumpers from third-party SCSI devices.
4. Install guide screws on the sides of the drive.

- Slide the drive into the drive bay until it clicks into place.

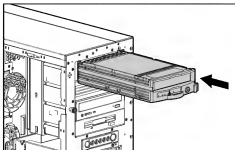


Figure 3-13. Installing a device mounted inside a removable media bay

NOTE: The interior of the server may look different depending on the model purchased.

- Connect the data cable and power cable to the back of the drive.

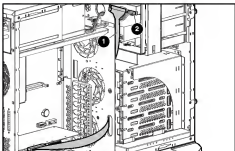


Figure 3-14. Connecting the drive cables

Installing a Tape Drive

To install a tape drive:



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Install guide screws on the sides of the drive.
3. To configure the device, set the SCSI device ID. You must manually set the SCSI device ID on each device to a unique value in the range of 0 through 6 for each SCSI bus. Refer to the documentation provided with the drive for instructions on setting the SCSI device ID.
4. Slide the drive into the drive bay until it clicks into place.

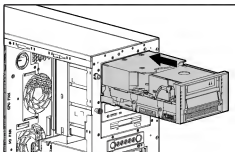


Figure 3-15. Installing a tape drive (DLT)

NOTE: The interior of the server may look different depending on the model purchased.

IMPORTANT: Compaq recommends installing the tape drive on a separate SCSI cable to avoid a decrease in performance of other SCSI devices.

5. Connect the data cable and power cable to the back of the drive.

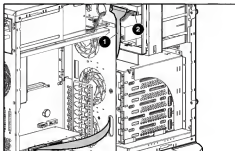


Figure 3-16. Connecting the tape drive cables

Removing a Device from Removable Media Bay

To remove a tape drive or other device:



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Disconnect the power cable and data cable from the back of the tape drive.

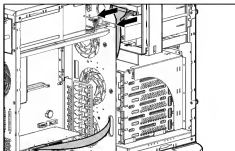


Figure 3-17. Disconnecting the tape drive cables

3. While pushing the drivelock up , pull the drive out of the drive bay .

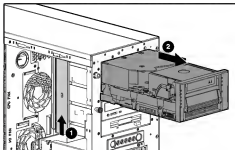


Figure 3-18. Releasing the tape drive

4. Remove the guide screws on the sides of the drive.
5. Install drive blanks into any empty bays.
6. Reinstall the access panel.

Installing an Expansion Board

Figure 3-19 and Table 3-2 identify the location of expansion slots.

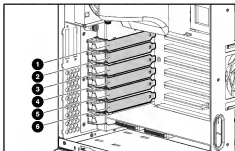


Figure 3-19. Locating expansion slots

Table 3-2
Expansion Slots

Item	Slot Type	Slot Number
	64-bit PCI	1
	64-bit PCI	2
	64-bit PCI	3
	64-bit PCI	4
	64-bit PCI	5
	32-bit PCI	6

To install an expansion board:



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

IMPORTANT: It may be necessary to remove the slot cover next to the slot in which you are installing a board.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Loosen the thumbscrew of the expansion board retainer , and then pull the retainer out and away from the chassis .

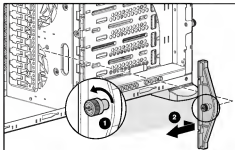


Figure 3-20. Removing the expansion board retainer

3. Press on the top of the expansion slot latch , and then open the latch toward the rear of the chassis .
4. Remove the expansion slot cover .

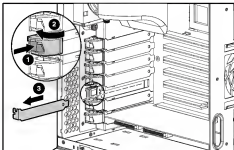


Figure 3-21. Removing the expansion slot cover

IMPORTANT: Be sure to insert expansion boards into the appropriate type of expansion slot. The 32-bit expansion boards must be inserted into 32-bit slots or 64-bit slots, and the 64-bit expansion boards must be inserted into 64-bit expansion slots.

5. Insert the expansion board
6. Close the expansion slot latch to secure the board
7. Connect any cables to the expansion board.

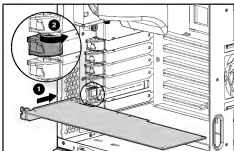


Figure 3-22. Installing an expansion board

8. Reinstall the expansion board retainer , and then tighten the thumbscrew .

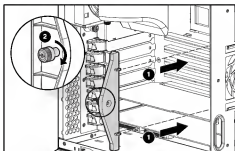


Figure 3-23. Reinstalling the expansion board retainer

9. Reinstall the access panel.

To remove an expansion board, reverse steps 1 through 8.

Removing the Fan Baffle

To remove the baffle:

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Loosen the thumbscrew that secures the baffle to the fan .
3. Slide the baffle out and away from the chassis .

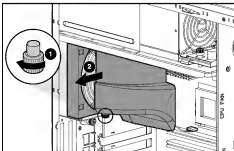


Figure 3-24. Removing the internal fan baffle

Memory Modules

Technical Information and Important Guidelines



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.



CAUTION: To prevent damage to the system when handling components, see Appendix B, "Electrostatic Discharge."



CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

When installing DIMMs, you must follow these guidelines:

- DIMMs must be industry-standard 168-pin PC 133-MHz or faster Registered SDRAM DIMMs. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL=2 or CL=3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information.
- Do not mix ECC and non-ECC SDRAM DIMMs. If different types of DIMMs are mixed, the system does not properly function.
- A DIMM can be installed only one way. Be sure to match the two key slots on the DIMM with the tab on the DIMM socket. Push the DIMM down into the DIMM socket, ensuring that it is fully inserted and properly seated.

Installing a Memory Module

The ProLiant ML350 Generation 2 server supports PC 133-MHz Registered ECC SDRAM DIMMs. Additional DIMMs are available to upgrade the memory. The server has four DIMM sockets located on the system board.

IMPORTANT: DIMMs do not need to be installed in pairs and can be installed in any sequence.

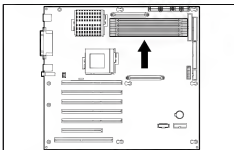


Figure 3-25. Locating DIMM sockets

To install a DIMM:

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Remove the fan baffle by performing the steps in "Removing the Fan Baffle" earlier in this chapter.
3. Press outward on both latches of the DIMM socket at the same time.
4. Insert the DIMM into the socket.
5. Return latches to the upright position.

NOTE: The latches may automatically close when the DIMM is properly inserted.

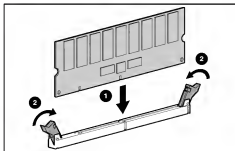


Figure 3-26. Installing a DIMM

6. Reinstall the access panel.

Removing a Memory Module

To remove a DIMM:



CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server at the beginning of this chapter.
2. Remove the fan baffle by performing the steps in "Removing the Fan Baffle" earlier in this chapter.
3. Press outward on both latches of the DIMM socket at the same time. This step releases the DIMM and pushes it partially out of the socket.
4. Lift the DIMM from the socket.

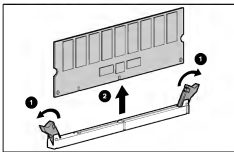


Figure 3-27. Removing a DIMM

5. Reinstall the access panel.

Processors and Processor Power Modules



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.



CAUTION: Static electricity can damage electronic components of the server. Before beginning these procedures, make sure that you are discharged of static electricity by briefly touching a grounded metal object.

To install or remove a processor or Processor Power Module (PPM), refer also to one of the following installation sources:

- For written instructions and illustrated installation procedures, refer to the installation documentation that came with the option kit.
- For an illustrated overview of the procedure, refer to the Quick Start Poster included in the shipping box or to the System Configuration label located on the inside of the access panel.

Installing a Processor with Heatsink

Compaq ProLiant ML350 Generation 2 servers support the installation of a second Intel Pentium III processor for enhanced performance. Processor option kits available for your ProLiant ML350 Generation 2 server consist of an Intel Pentium III processor with heatsink and a Power Processor Module (PPM).

IMPORTANT: When you install a second processor and PPM, both processors must be the same type and speed.

IMPORTANT: Only install the specific PPM provided in the option kit with your processor.

Observe the warnings and cautions provided in the option kit documentation and in this guide. To install the processor and heatsink assembly:

1. Verify that all critical data has been backed up.
2. Ensure that your server has the most current ROM version. To update your ROM, see the following website:
www.compaq.com/support/files/
3. Power down the server and remove the access panel as described in the section applicable to your tower or rack server earlier in this chapter.
4. To gain access to the processor sockets, remove the internal fan baffle. See "Removing the Fan Baffle" earlier in this chapter.
5. Locate the processor socket and corresponding PPM slot on the system board.

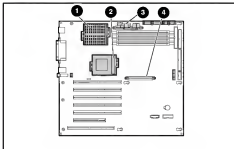


Figure 3-28. Locating the processor sockets and Processor Power Module (PPM) slots

Table 3-3
Processor Sockets and Processor Power Module Slots

Item	Description
	Processor socket 1 (shown)
	Processor socket 2
	PPM slot 1 (shown)
	PPM slot 2

6. Raise the processor socket lever to open the socket .
7. Place the processor into the socket . Use the processor socket guide posts to align the processor.



CAUTION: Performing these steps in reverse order will cause the processor socket on the system board to break.

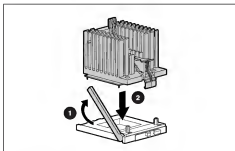


Figure 3-29 Installing the processor and heatsink assembly

NOTE: The processor and sockets are keyed to fit one way only.

8. Lower the processor socket lever to secure the assembly in the socket, as shown in Figure 3-30.

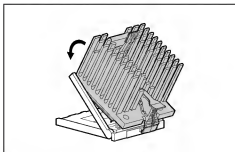


Figure 3-30. Securing the processor and heatsink assembly in the socket

9. Lift the heatsink retaining clip over the rear edge of the socket and hook underneath the socket tabs.

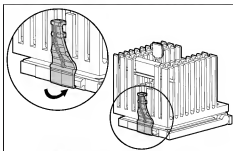


Figure 3-31. Seating the processor clip on the rear of the socket

10. Clasp the front of the assembly clip over the front edge of the socket
11. Press the assembly clip down to secure the heatsink and processor assembly in the socket



CAUTION: Applying too much pressure on the assembly clip lever could cause it to break. Use care when performing this step.

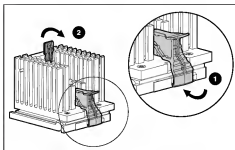


Figure 3-32. Securing the processor and heatsink assembly on the front of the socket

Installing a Processor Power Module

IMPORTANT: A new PPM must always be installed with a new processor.

To install a PPM:

1. Locate the second PPM slot and position the PPM above the slot. The PPM is keyed to fit only one way in the slot.
2. Make sure latches are open before pressing the PPM into slot .
3. Press evenly on the PPM to insert it into the slot until latches snap up to secure the module .

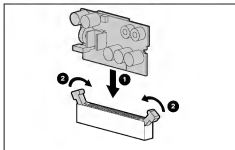


Figure 3-33. Installing a Processor Power Module (PPM)

Removing a Processor

1. Remove the access panel by following the steps in the section applicable to your tower or rack server earlier in this chapter.
2. Remove the fan baffle by performing the steps in "Removing the Fan Baffle" earlier in this chapter.
3. Locate the processors and PPMs as shown in Figure 3-28 and Table 3-3.
4. Press one side of the heatsink retainer clip to disengage the heatsink from the processor socket.
5. Unhook the opposite side of the heatsink retainer clip from the processor socket.
6. Lift up the lever on the processor socket until it releases.

IMPORTANT: The lever must be perpendicular to the system board to unlock the processor unit.

7. Remove the processor from the processor socket.

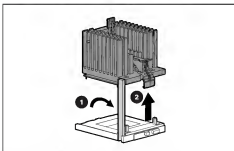


Figure 3-34. Removing the processor from the processor socket

8. Reinstall the access panel.

Removing a Processor Power Module

1. Open the latches of the PPM slot .
2. Remove the PPM from the slot .

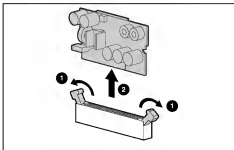


Figure 3-35. Removing a Processor Power Module (PPM)

Replacing Batteries



WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose it to temperatures higher than 60°C (140°F).



CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel



CAUTION: Static electricity can damage electronic components of the server. Before beginning these procedures, be sure that you are discharged of static electricity by briefly touching a grounded (earthed) metal object.

The ProLiant ML350 Generation 2 has nonvolatile memory which requires batteries to retain system information. There is a battery on the system board and a battery on the Server Feature Board.

Replacing the System Board Battery

If your server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. When replacing a battery, use a CR2032 3-volt lithium coin cell battery.

After you have completed the battery installation, restart the system and run RBSU by pressing the **F9** key to reconfigure your system.

To replace the lithium battery:

1. Remove the access panel by following the steps applicable to your tower or rack server earlier in this chapter.
2. Locate the battery on the system board. See Figure 3-36 for the battery location.

NOTE: If you have expansion boards installed, you may need to remove them to access the battery. See "Installing an Expansion Board" earlier in this chapter.

3. Press the release lever , and then slide the battery out of the holder .

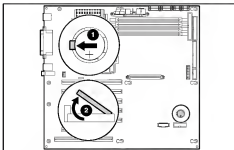


Figure 3-36. Removing the battery from the system board

4. Snap the replacement battery into the holder in the proper position.

IMPORTANT: Positive polarity (+) should be positioned facing out.

5. Reinstall the access panel.
6. Run the ROM Based Setup Utility (RBSU) to reconfigure your system.

Replacing the Server Feature Board Battery

To replace the Server Feature Board battery:

NOTE: It may be necessary to remove the Server Feature Board from the unit to replace the battery.

1. Remove the access panel by following the steps in the section applicable to your tower or rack server earlier in this chapter.
2. Slide the battery out of the holder.

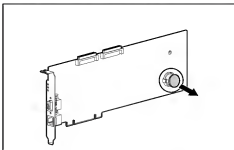


Figure 3-37. Removing the battery from the Server Feature Board

3. Slide the replacement battery into the proper position.

IMPORTANT: Positive polarity (+) must be positioned facing out.

4. Replace the access panel and connect cables to the server.
5. Run RBSU to reconfigure your system after restarting by pressing the F9 key when prompted in the lower right corner of the screen.

Installing the Hot-Plug Redundant Power Supply

To install the hot-plug redundant power supply:



WARNING: To reduce the risk of personal injury or damage to the equipment, the installation of power supplies should be performed only by individuals who are qualified in servicing server equipment and trained to deal with products capable of producing hazardous energy levels.



WARNING: To reduce the risk of personal injury from hot surfaces, observe the thermal labels on each power supply or module.



WARNING: To reduce the risk of injury from electric shock hazards, do not open power supplies. Refer all maintenance, upgrades, and servicing to qualified personnel.



CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure.

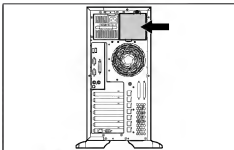


Figure 3-38. Identifying the redundant power supply bay

1. Identify the redundant power supply bay at the back of the server.

IMPORTANT: Power supplies of the ProLiant ML350 Generation 2 server are hot-pluggable. When using the redundant power supply option, it is not necessary to power down the server before removing or installing a power supply.

2. Remove the thumbscrew that secures the redundant power supply blank, and then lift the blank from the back of the server.



WARNING: To reduce the risk of electric shock or damage to the equipment, do not connect AC power cords to uninstalled power supplies.

3. Slide the power supply into the power supply bay, and then apply pressure to the power supply until the release/lock lever clicks the power supply securely into the bay.
4. Connect the AC power cord to the power supply.
5. Verify that the power supply and the redundant power supply LEDs are green. See Appendix E, "LED Indicators, Switches, and Jumpers," for details.

Chapter **4**

Cabling Guidelines

This chapter provides an overview of the internal cabling of the Compaq ProLiant ML350 Generation 2 server chassis. It also includes information on how to cable SCSI, IDE, and removable media devices in the system, as well as information about all critical system cabling. If external cabling is required, refer to the documentation included with your external storage option device.

Storage Device Installation Guidelines

Consider the following guidelines when adding SCSI devices:

- As a general rule, a maximum of seven devices may be added per channel. Your server is equipped with two Wide Ultra3 SCSI channels.
- The configuration settings on each SCSI device should be set to the SCSI ID of the bay (Bay 0 = SCSI ID 0) that it will occupy.
- If only one SCSI hard drive is used, it should be installed in the lowest-numbered bay (0).
- Be sure to remove all terminating jumpers from third-party SCSI devices.



CAUTION: To prevent damage to the equipment, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before installing devices.



CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

Identifying SCSI Components

Hot-Plug Hard Drive SCSI Cable

The SCSI cable shown in Figure 4-1 is included with the server. The SCSI cable connects the hot-plug drive cage to the SCSI controller. The hot-plug hard drive cage has built-in termination.

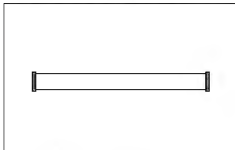


Figure 4-1. Identifying the hot-plug hard drive SCSI cable

Internal SCSI Components

Before cabling the server, note the removable media and hard drive cage locations as shown in Figure 4-2 and Table 4-1. For additional information about installing optional SCSI devices, refer to the documentation included with the SCSI devices.

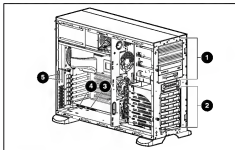


Figure 4-2. Internal SCSI components

Table 4-1
Internal SCSI Component Locations

Number	Description
1	Removable media area
2	Hard-drive cage
3	SCSI channel A (primary)
4	SCSI channel B (secondary)
5	SCSI knockouts

68-to-50 pin SCSI Adapter

If installing a device that uses a Fast SCSI-2 interface, you must provide a 68-to-50 pin SCSI adapter (Compaq Part Number 199618-001), shown in Figure 4-3. This adapter should be installed between the 50-pin interface on the device and the 68-pin SCSI cable connected to the SCSI channel on the Server Feature Board.

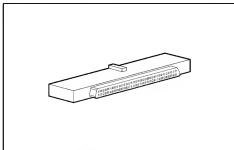


Figure 4-3. 68-to-50 pin (wide-to-narrow) SCSI adapter

Cabling SCSI Devices in the Removable Media Area

The following steps detail the procedure for cabling an integrated Wide Ultra3 SCSI controller (channel B) to a removable media or other device:

1. Follow the steps in the sections following "Installing a Device into a Removable Media Bay" in Chapter 3, "Hardware Options Installation." Make sure that the SCSI ID is uniquely set on each device.
2. Locate the SCSI cable that is attached to SCSI channel B.
3. Install the next available connector to the device .
4. Install the next available power connector to the device .

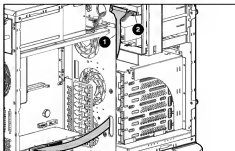


Figure 4-4. Cabling a SCSI device

Cabling a Smart Array or Other RAID Controller

Many configurations are possible when SCSI controllers are added. This section outlines the procedure for connecting internal hard drives to a SCSI controller option or a Smart Array Controller and assumes that the controller option or Smart Array Controller is already installed.

1. If hard drives and the SCSI or Smart Array Controller are not already installed, follow the steps in the sections "Installing and Removing a Hot-Plug Hard Drive" and "Installing an Expansion Board" in Chapter 3, "Hardware Options Installation."
2. Locate the SCSI cable that is connected to the Server Feature Board SCSI controller channel A.

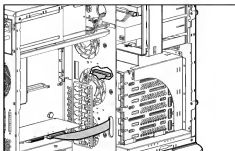


Figure 4-5. Locating the SCSI cable (SCSI channel A)

3. Remove the SCSI cable from the SCSI channel A connector on the system board.
4. Reconnect the SCSI cable to either the SCSI controller option or Smart Array Controller.

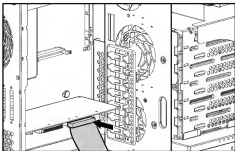


Figure 4-6. Connecting a SCSI cable to a SCSI controller option or Smart Array Controller

NOTE: Both SCSI channels on the Server Feature Board are self-terminating. If you choose to not use one or both of the SCSI channels, you do not need to terminate the unused channel(s).

Installing an Internal-to-External SCSI Connector

If you are not using one or both SCSI channels (A or B) internally or you install a SCSI or Smart Array option card, you may install an internal-to-external SCSI connector (Compaq Part Number 159547-B2I) in the SCSI knockout locations on the rear of the chassis. To install an internal-to-external SCSI connector, perform the following steps:

1. Using a Torx T-15 screwdriver, remove the screw holding the SCSI knockout cover plate , and then remove the cover plate .
2. Insert the SCSI connector into the open area . Secure the external SCSI connector to the chassis using the screws provided with the external SCSI connector option kit .

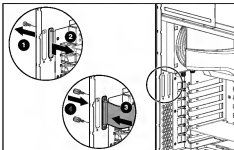


Figure 4-7. Installing an internal-to-external SCSI connector

3. Secure the internal-to-external SCSI connector cable to either internal SCSI channel (A or B) or to the SCSI channel of an option card.

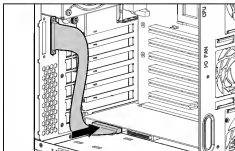


Figure 4-8. Connecting the cable to Server Feature Board SCSI channel B

NOTE: The interior of the server may look different depending on the model you purchased.

Connecting IDE Devices to the Integrated IDE Controller

Your server includes one IDE cable (the Cable Select Cable) that can connect up to two IDE devices to the system through the integrated IDE controller. This cable has three clearly labeled connectors. If only one IDE device is connected to the system, it must be secured to the cable connector labeled Drive 0. All IDE devices in the system should have their configuration jumpers set to "Cable Select" or "CS."

IMPORTANT: If your network operating system is Novell NetWare, Compaq recommends that you connect your CD-ROM to the primary IDE channel and to the Drive 0 connector on the IDE cable.

NOTE: IDE hard drives are not supported.

Connecting the System Fan

The system fan is an integral part of the ProLiant ML350 Generation 2 server system design. Proper cabling of the fan helps to avoid potential server failure and operating system error messages.

Connect the system fan to the system board as illustrated in Figure 4-9.

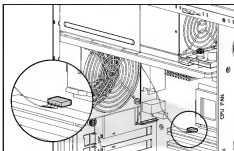


Figure 4-9. Connecting the system fan (baffle has been removed for clarity)

Server Configuration and Utilities

This chapter provides information about the following utilities and support tools included with your Compaq ProLiant ML350 Generation 2 server:

- ROM Based Setup Utility (RBSU)
- ROMPaq
- SmartStart for Servers
- SmartStart Diskette Builder
- Compaq Insight Manager
- Compaq Survey Utility
- Compaq Diagnostics Utility
- Automatic Server Recovery-2 (ASR-2)
- Power-On Self-Test (POST)

ROM Based Setup Utility

RBSU performs a wide range of configuration activities, including the following:

- Configuring system devices and installed options
- Viewing system information
- Selecting the operating system
- Selecting the primary boot controller

In addition, RBSU includes other features, which are outlined in "Using RBSU" later in this chapter.

For information on RBSU not found in this guide, refer to the *Compaq ROM Based Setup Utility User Guide* found in your documentation pack.

Navigating RBSU

To make selections within RBSU, use the following keys:

- To access RBSU, press the **F9** key during startup when prompted in the lower right corner of the screen.
- The arrow keys navigate through the menu system.
- Selections are made by pressing the **Enter** key.
- Selections are cancelled by pressing the **Escape** key.
- Selections and changes are saved by pressing the **F10** key.

Using RBSU

NOTE: Most of the features in RBSU are not required in the setup of your server. The options in this utility are designed to assist with specific server configuration issues.

RBSU is separated into a series of menu selections designed to configure specific areas of the system. The primary menus are as follows:

- System Options
- IPL Boot Device
- PCI Devices
- Boot Controller Order
- Date and Time
- Automatic Server Recovery-2 (ASR-2)
- Server Passwords
- Server Asset Text
- Advanced Options
- Utility Language

System Options

The System Options menu configures the basic input/output (I/O) of the server and sets the operating system. The configuration options include the operating system, external ports, and controlling the diskette drive. The following is a list of selections found in this menu with an explanation of each option:

- **OS Selection** selects the primary operating system for the server. Default sever settings are automatically set based on the operating system selected.
- **Embedded COM Port X** sets the configuration for the internal serial port A or B. The configuration options include the address and interrupt request (IRQ). This option can also disable the port.
- **Embedded NIC Port 1 PXE Support** enables the Pre-boot Execution Environment (PXE) support for NIC Port 1. The Embedded NIC Port PXE Support option allows the server to boot to the network and attach to a PXE server with boot images. When enabled, the NIC port is displayed in the Initial Program Loader (IPL) list.
- **Diskette Write Control** allows the user to configure the write control of the diskette drive. It can be set to read and write or to read only.

- **Diskette Boot Control** enables you to have the system boot from the removable media device.
- **Embedded LPT Port** allows the user to enable the embedded LPT Port at the specified resource settings or disable the option.

IPL Boot Device

The **IPL Boot Device** menu option configures the Initial Program Loader (IPL) device. It controls the search order the server goes through to look for a bootable device.

PCI Devices

The **PCI Devices** menu option displays and modifies the configuration of the PCI devices installed in the server. Information for each slot is displayed and the IRQs can be changed. Multiple PCI devices can share an interrupt.

Boot Controller Order

The **Boot Controller Order** menu option is used to view and assign the current controller order.

Date and Time

The **Date and Time** menu option is used to set the system date and time.

Automatic Server Recovery-2

The **Automatic Server Recovery-2** menu configures the Automatic Server Recovery-2 (ASR-2) features and may include the following options:

- **ASR-2 Status** enables or disables ASR-2. When set to **Disabled**, no ASR-2 features function.
- **ASR-2 Timeout** sets a timeout limit for resetting a server that is not responding. When the server has not responded in the selected amount of time, it automatically resets.
- **Thermal Shutdown** enables or disables the ability of the server to automatically power down when it reaches a dangerous temperature.

Server Passwords

The **Server Passwords** menu configures the password environment of the server. The available options are:

- **Set Admin Password** sets a password to control access to the administrative features of the server. When this password is set, the administrative features of the server cannot be accessed without the correct password being entered.
- **Set Power-On Password** sets a password to control access to the server during power up. When this password is set, the server cannot be powered up without the correct password being entered.
- **Network Server Mode** is a security feature that protects an unattended network server while allowing it to run after a power interruption. When set to **Disabled**, the server operates normally. When set to **Enabled**, the following actions occur:
 - ☐ The local keyboard does not function unless the power-on password is entered.
 - ☐ When there is not a diskette in the diskette drive, the power-on password is bypassed, allowing the server to start.
 - ☐ When there is a diskette in the diskette drive, the server does not start unless the power-on password is entered locally.

IMPORTANT: Network Server Mode cannot be enabled until a power-on password has been established through the **Set Power-On Password** menu.

- **Quicklock** enables or disables the Quicklock feature. When set to **Enabled**, the keyboard is locked by pressing the **Ctrl+Alt+L** keys. The keyboard remains locked until the password is typed in.

IMPORTANT: If the password is disabled at the power-on key prompt, the Quicklock password feature will remain active until the next time the system is powered up.

Server Asset Text

The **Server Asset Text** menu customizes the system-specific text for the server, including the following:

- **Set Server Information Text** defines reference information for the server, such as **Server Name**, **Server Asset Tag**, **Server Primary OS**, and **Other Text**.
- **Set Administrator Information Text** defines reference information for the server administrator, such as **Admin Name Text**, **Admin Phone Number Text**, **Admin Pager Number Text**, and **Other Text**.
- **Set Service Contact Text** defines reference information for the service contact of the server, such as **Service Name Text**, **Service Phone Number Text**, **Service Pager Number Text**, and **Other Text**.
- **Serial Number** allows the user to change the chassis serial number.

Advanced Options

The **Advanced Options** menu is used to configure advanced options of the system. The following is a list of selections found in this menu with an explanation of each option:

- **MPS Table Mode** allows the user to change the advanced programmable interrupt controller (APIC) table setting. This selection should be automatically set by **OS Selection**, but it allows the user to override the automatic selection.

NOTE: The latest operating systems from Microsoft, Novell, and SCO bypass the use of IRQs and use an APIC. The APIC has been designed to address the issues associated with limited IRQs, multiprocessor systems, and shared interrupts. If you are using the latest operating system, you can let the system automatically configure interrupts for all devices in the system.

- **POST Speed Up** allows the user to enable or disable the quick or slow start process. The slow start process performs a complete memory test.
- **F1 Prompt** configures the server to require the user to press the **F1** key to proceed during power up when an error is encountered during the power-up sequence.

- **Redundant ROM** toggles the server ROM between the current ROM and the backup ROM.
- **Erase Non-Volatile Memory** resets the non-volatile memory of the server to an initial, factory state. When **Yes** is selected, the non-volatile memory is erased and set to an initial, factory state.
- **Set CPU Corrected** is used to indicate that a previously failed processor has been corrected.
- **Wake Support (PME)** allows the user to enable or disable Wake Support (PME).
- **Secondary IDE Controller** allows the user to enable or disable the secondary IDE controller.
- **NMI Debug Button** allows the user to disable or enable the NMI debug button on the Server Feature Board.

Utility Language

The **Utility Language** option is used to set the language in which RBSU is displayed.

ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive, remove power from the system, and then power up the system again.

NOTE: See "SmartStart Diskette Builder" later in this chapter for instructions on creating a ROMPaq diskette.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.



CAUTION: Do not power down during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from starting.

SmartStart for Servers Software

The SmartStart for Servers CD is used to load the system software, thereby achieving a well-integrated server and ensuring maximum dependability and supportability. The SmartStart for Servers CD contains diagnostic utilities and ROMPaq tools.

To install the SmartStart for Servers CD, press the **F9** key to run RBSU and configure the primary operating system. Next, follow these steps:

1. Locate the SmartStart for Servers CD in the Server Setup and Management pack.
2. After you power up the server, press the CD-ROM drive eject button.
3. Insert the SmartStart for Servers CD into the CD-ROM drive with the labeled side up. Handle the CD by its edges, not by the flat surfaces of the disc.
4. When the busy indicator turns green, the SmartStart sequence begins.

Refer to the SmartStart documentation included with your server to install the operating system, create updated driver diskettes, and run upgrade utilities.

SmartStart Diskette Builder

The SmartStart for Servers CD contains a utility to generate support diskettes in the event that they are needed or the software cannot be used directly from the SmartStart for Servers CD. Support diskettes are “punched-out” from data stored on the SmartStart for Servers CD. The support includes:

- Array Configuration Utility (ACU)
- Operating System support
- Server utilities
- Erase utility
- System and Option ROMPaq diskettes

To run the Diskette Builder, use a workstation running Windows 95, Windows 98, Windows NT, or Windows 2000. You also need several 1.44-MB diskettes. All data on the diskettes will be overwritten. Insert the SmartStart CD into the workstation drive. The CD automatically runs the Diskette Builder utility; however, if the system does not support the “auto-run” feature, use Windows Explorer to run
`[CD-ROM DRIVE]:\DSKBLDR\DSKBLDR.EXE`.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq devices, and includes the following functions:

- Forwards server alerts and fault conditions
- Monitors fault conditions and server performance
- Controls server security and configuration
- Remotely controls server
- Initiates rapid recovery services

Documentation for Compaq Insight Manager is available on the Compaq Management CD in [CD-ROM DRIVE]:\OVERVIEW.HLP.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq prefailure warranties on processors, hard drives, and memory modules.

Compaq Survey Utility

Compaq Survey Utility is an online information-gathering agent for Microsoft Windows, Novell NetWare, and Linux that collects critical hardware and software information from various sources. If a significant change occurs between data-gathering intervals, the previous information is marked, and the data file is overwritten to reflect the latest configuration and changes. This file allows you to keep a historical record of change events for server hardware and software.

Compaq Survey Utility automatically runs at startup and on specified time intervals. You can modify the data-gathering interval by modifying the command-line parameters.

For more information on Compaq Survey Utility, including installation and application procedures, refer to the *Compaq Survey Utility Online Help User Guide* accessed through the Compaq website:

www.compaq.com/support/files/server/

Perform a search for "Survey Utility," and then follow the appropriate link.

Compaq Diagnostics Utility

The Compaq Diagnostics Utility tests the operation of your Compaq hardware and isolates failed parts, whenever possible. Diagnostic error codes are generated when the Diagnostics Utility recognizes a problem. These error codes help identify defective components. A Diagnostics diskette can be made by running the Compaq Server Diagnostics file available for download from the following website:

www.compaq.com/support/files/server

Automatic Server Recovery-2

ASR-2 is a feature of ProLiant servers that resets the system in the event of a catastrophic operating system error like a blue-screen, ABEND (abnormal end), or panic. A system failsafe timer, the ASR-2 timer, is started when the Compaq System Management driver, also known as the health driver, is loaded. The timer is reset periodically during normal operation, but in the event of operating system failure, the timer expires and restarts the server. ASR-2 increases server up time by restarting the server within a predetermined amount of time after the system stops responding. The Compaq Insight Manager console notifies you in the event of an ASR-2 restart. You can disable ASR-2 from the Compaq Insight Manager console.

Power-On Self-Test

POST is a series of diagnostic tests that checks firmware and assemblies to ensure that the system is functioning properly. This utility runs automatically every time the server is powered up.

See Appendix D, "Troubleshooting," for the normal power-up sequence and diagnosis of problems encountered during POST.

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, your product has been assigned a unique Compaq series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this series number. The series number should not be confused with the marketing name or model number of the product.

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class A devices do not have an FCC logo or FCC ID on the label. Class B devices have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with the FCC Logo—United States Only

This device complies with Part 15 of the FCC Rules Operation and is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or

1-800-652-6672 (1-800-OK COMPAQ). For continuous quality improvement, calls may be recorded or monitored.

For questions regarding this FCC declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

or

(281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RF/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low-Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22)—Electromagnetic Interference
- EN55024 (IEC61000-4-2,3,4,5,6,8,11)—Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN60950 (IEC950)—Product Safety

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwanese Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Battery Replacement Notice

Your server is provided with a lithium manganese dioxide battery. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. For more information about battery replacement or proper disposal, contact your Compaq authorized reseller or authorized service provider.



WARNING: Your server contains an internal lithium manganese dioxide battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose to temperatures higher than 60°C.
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the Compaq spare designated for this product.



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, use the public collection system or return them to Compaq, your Compaq authorized service resellers or providers, or their agents.

Laser Compliance

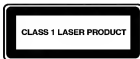
The CD-ROM drive contains a laser diode of gallium aluminum arsenide (GaAlAs) emitting in the wavelength range of 780 ± 35 nm. All Compaq systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous laser radiation.



WARNING: Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- Do not try to open the unit enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Allow only Compaq authorized service providers to repair the unit.

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.



This marking on the internal CD-ROM drive indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Power Cords

If you were not provided with a power cord for your server, you should purchase a power cord that is approved for use in your country.

The power cord must be rated for the product and for the voltage and current marked on the product electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 1.00 mm² or 18AWG, and the length of the cord must be between 1.8 m (6 ft) and 3.6 m (12 ft). If you have questions about the type of power cord to use, contact your Compaq authorized service provider.

A power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. An electrostatic discharge (ESD) from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Discharge

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded (earthed) surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded (earthed) workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm $\pm$ 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have a Compaq authorized reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Compaq authorized reseller.

Server Error Messages

The following POST error message is new and unique to some Compaq ProLiant servers:

A processor thermal event occurred prior to this power up, Processor X— indicates that processor X (1 or 2) has reached an excessive temperature and has stopped operation. Verify the following information:

- The processor and heatsink assembly is properly installed
- Ambient temperature is within an acceptable range

See Appendix F, “Specifications,” for operational temperature requirements.

For a complete listing of error messages provided for your server, refer to the *Compaq Servers Troubleshooting Guide*.

Appendix **D**

Troubleshooting

This appendix provides specific troubleshooting information for the Compaq ProLiant ML350 Generation 2 server and is to be used to find details about server startup and installation problems.

See Appendix E, “LED Indicators, Switches, and Jumpers,” for information on LEDs, switch settings, and jumpers.

For information about general troubleshooting techniques, diagnostic tools, error messages, and preventative maintenance, refer to the *Compaq Servers Troubleshooting Guide*, also included in your user documentation.

This appendix includes the following topics:

■ **When the Server Does Not Start**

You are provided with step-by-step instructions on what to try and where to go for help for the most common problems encountered during the initial Power-On Self-Test (POST). A successful startup requires the server to complete this test each time you power up, before the server can load the operating system and start running software applications.

■ **Problems After Initial Startup**

After your server has passed the POST, you may still encounter errors, such as an inability to load your operating system. You are provided with instructions on what to try and where to go for help when you encounter errors after the server completes the POST.

■ **Other Information Resources**

This section provides a list of reference information available for your server.

For troubleshooting information beyond the scope of this guide, both general and specific to the ProLiant ML350 Generation 2 server, see "Other Information Resources" later in this appendix.

When the Server Does Not Start

This section provides step-by-step instructions on what to try and where to go for help with the most common problems encountered during the initial Power-On Self-Test (POST). During every power up, POST must be completed before the server can load the operating system and start running software applications.

If the server completes POST and attempts to load the operating system, go to “Problems After Initial Startup” later in this appendix.



WARNING: There is a risk of personal injury from hazardous energy levels. The installation of options and the routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Complete the following steps when the server does not start:

1. Verify that the server and monitor are plugged into a working outlet.
2. Make sure that your power source is working properly:
 - a. Check status using the Power On/Standby LED. See “System Status LEDs” in Appendix E for the location of the Power On/Standby LED.
 - b. Verify that the Power On/Standby switch was pressed firmly.

Refer to the “Power Source” section in the *Compaq Servers Troubleshooting Guide* for details on what else to check.

3. If the system does not complete the Power-On Self-Test (POST) or start loading an operating system, refer to the "General Loose Connections" section in the *Compaq Servers Troubleshooting Guide*.

NOTE: If the server is rebooting repeatedly, verify that the system is not restarting due to an Automatic Server Recovery-2 (ASR-2) power-up caused by another problem. Check Compaq Insight Manager for notification of this event. Refer to the *Compaq Servers Troubleshooting Guide* for more information.

4. Restart the server.
5. Check for the following "normal power up sequence" to verify that your system meets the minimal hardware requirements and is powered up under normal operation:
 - a. The front panel Power On/Standby LED turns green.
 - b. The fans start up.
 - c. The server ROM initializes the server in the following sequence:
 - Video initialization—The Compaq initialization screen is displayed.
 - Processor initialization
 - Memory test
 - Memory initialization
 - Diskette drive
 - SCSI devices (if applicable)
 - ATA devices (if applicable)
 - Option ROM
 - d. The operating system loads to complete the boot process.

If the problem persists, continue with the following section, "Diagnosis Steps."

Diagnosis Steps

If your server does not power up, or powers up but does not complete the Power-On Self-Test (POST), answer the questions in Table D-1 to determine appropriate actions based on the symptoms observed. According to the answers you give, you will be directed to the appropriate table in the section that immediately follows. That table outlines possible reasons for the problem, options available to assist in diagnosis, possible solutions, and references to other sources of information.

Table D-1
Diagnosis Steps

Question	The Next Step
Question 1: Is the front panel Power-On/Standby LED on? (either solid green or flashing)	If no, go to Table D-2. If yes, continue to Question 2.
Question 2: Can you see anything on your monitor?	If no, go to Table D-3. If yes, video is available for diagnosis. Determine next action by observing POST progress and error messages. Refer to the <i>Compag Servers Troubleshooting Guide</i> for a complete description of each POST error message.
Note: If your server attempts to load the operating system, go to "Problems After Initial Startup" later in this appendix.	

Table D-2
Front Panel Power-On/Standby LED Is Not On

See "LEDs" for a complete description of system status LEDs.



WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reset components, power down the server and disconnect the power cord.

Possible Reasons	The Next Step
There is no AC power connection.	1. Check the power cables. Make sure that they are fully connected.
Power button was not firmly pressed.	2. Press the power button.
Power button connector cable is not properly connected to the system board.	3. Check the power source.
Processor has failed or is not properly seated.	Refer to "Power Problems" in the <i>Compaq Servers Troubleshooting Guide</i> for further options.
Power supply has failed or is not connected.	4. Reconnect the power button cable to the system board.
	Refer to section "System Board Components" in Chapter 1, "Server Features," for the location of the power button connector.
	5. Power down the server. Reset all expansion boards, and verify that all cables are securely connected.
	See Chapter 3, "Hardware Options Installation," for complete instructions.
	Refer to "General Hardware Problems" in the <i>Compaq Servers Troubleshooting Guide</i> for tips on proper procedures.
	6. Check the diagnostic LEDs on the system board. See Appendix E, "LED Indicators, Switches, and Jumpers" for additional information.
	7. If these steps do not correct the problem, the most likely cause lies either in the power supply subsystem or the processor. Contact your Compaq authorized service provider for further technical support.
	Refer to the <i>Compaq Servers Troubleshooting Guide</i> for a list of Compaq authorized service providers.

Table D-3
Server Does Not Have Video



WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reset components, power down the server and disconnect the power cord.

Possible Reasons	The Next Step
Video may not be properly connected. Switches may not be correctly set on the Server Feature Board. If an optional video card was installed, the monitor cable may not be correctly connected. The monitor may be connected to the wrong video connector.	1. Verify that the monitor has power and that the monitor cable is securely connected. If more than one video adapter is installed, make sure that the monitor is connected to the correct video card. 2. Verify that the monitor is functional by connecting it to a known working server. 3. Power down the server. Reset all cards and memory modules, and verify all cable connections. See Chapter 3 for bezel and side panel removal. 4. Restart the server. 5. Listen for audible indicators, such as a series of beeps. A series of beeps indicates the presence of a Power-On Self-Test (POST) error message. Refer to the <i>Compaq Servers Troubleshooting Guide</i> for a complete listing of possible POST error messages. 6. Check the system board "red" LEDs. See Appendix E, "LED Indicators, Switches, and Jumpers," for additional information. 7. Refer to "Video Problems" in the <i>Compaq Servers Troubleshooting Guide</i>. 8. If these steps do not correct the problem, contact your Compaq authorized service provider for further technical support.

Problems After Initial Startup

After your server has passed the Power-On Self-Test (POST), you may still encounter errors, such as an inability to load your operating system. Use Table D-4 to troubleshoot server installation problems that occur after the initial startup.

For updated information on supported operating systems, log on to the Internet at

www.compaq.com/products/servers/platforms/

NOTE: If the server is rebooting repeatedly, verify that the system is not restarting due to an Automatic Server Recovery-2 (ASR-2) power up caused by another problem. Check Compaq Insight Manager for notification of this event. Refer to the *Compaq Servers Troubleshooting Guide* for more information.

Refer to the *Compaq Servers Troubleshooting Guide* for the following:

- Information you need to collect when diagnosing software problems and to provide when contacting support
- Instructions on how to upgrade your operating system and its drivers
- Information on available recovery options and advice on minimizing downtime

Table D-4
Problems After Initial Startup

Problem	Possible Cause	Possible Solution
System cannot load SmartStart	Wrong version of SmartStart is being installed.	1. Check the SmartStart release notes and user documentation. 2. Refer to the Compaq website to verify the version of SmartStart
	The CD-ROM/diskette drive assembly is not set as a bootable device.	1. Press the F9 key to run the ROM Based Setup Utility (RBSU) when prompted. 2. Set defaults and exit the utility. 3. Rerun RBSU to verify the system configuration. Refer to Chapter 5, "Server Configuration and Utilities," or the Compaq <i>ROM Based Setup Utility User Guide</i> on your server documentation CD for complete instructions on the use of RBSU.
	The CD-ROM/diskette drive assembly is either not installed, or is not properly connected.	1. Power down the server. 2. Verify that the CD-ROM/diskette drive assembly is installed. 3. Remove and reset the CD-ROM/diskette drive assembly. 4. Check the cable between the backplane and the CD-ROM/diskette drive assembly to ensure proper connection. Refer to the <i>Compaq ProLiant ML350 Generation 2 Server Maintenance and Service Guide</i> for connection information. If the cable is not the problem, refer to "CD-ROM Problems" in the <i>Compaq Servers Troubleshooting Guide</i>.
	Diskette in CD-ROM/diskette drive assembly is preventing the system from loading.	Remove the diskette.

continued

Table D-4
Problems After Initial Startup *continued*

Problem	Possible Cause	Possible Solution
SmartStart fails during installation.	Operating system has not been selected.	1. Press the F9 key to run the ROM Based Setup Utility (RBSU) when prompted. 2. Select the primary operating system. Refer to Chapter 5, "Server Configuration and Utilities," or the <i>Compaq ROM Based Setup Utility User Guide</i> for complete instructions on the use of the setup utilities.
	Error occurs during installation.	Follow the error information provided. If it is necessary to reinstall, first run the Compaq System Erase Utility. Refer to the <i>Compaq Servers Troubleshooting Guide</i>.
 CAUTION: The Compaq System Erase Utility causes the loss of all configuration information, as well as loss of existing data on all connected hard drives. Read "Compaq System Erase Utility" and the associated cautionary statements in the <i>Compaq Servers Troubleshooting Guide</i> before performing this operation.		
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: 1. Note at which phase the operating system failed. 2. Remove any loaded operating system components. 3. Refer to your operating system documentation. 4. Reinitiate installation procedures.

continued

Table D-4
Problems After Initial Startup *continued*

Problem	Possible Cause	Possible Solution
Server cannot load operating system. <i>continued</i>	Installation problem occurred.	Refer to your operating system documentation and to the SmartStart release notes.
	Primary hard drive controller installation is incorrect.	Run RBSU by pressing the F9 key to correct this problem.
	Hard drive controller order is incorrect.	Run RBSU by pressing the F9 key to correct this problem.
	Encountered problem after new hardware was added to the system.	Refer to the documentation provided with the hardware. Remove the new hardware.
	Problem was encountered with hardware added to a new system ordered with a factory-installed operating system (where available).	You must complete the factory-installed operating system software installation BEFORE adding new hardware to the system. Be sure that you are following the instructions provided in the <i>Factory-Installed Operating System Software Installation Guide</i> . Remove the new hardware and complete the software installation. Then, reinstall the new hardware.

Note: Refer to Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide* for complete instructions on the use of RBSU.

Other Information Resources

Refer to the following information in Table D-5 for additional help.

Table D-5
ProLiant ML350 Generation 2 Server Troubleshooting Resources

Resource	What it is
<i>Compaq Servers Troubleshooting Guide</i>	This is a resource for obtaining troubleshooting information that is beyond the scope of this document. It includes general hardware and software troubleshooting information for all Compaq ProLiant servers, a complete list of error messages along with an explanation of probable cause, and a list of appropriate measures. This guide ships with your server.
<i>Compaq ProLiant ML350 Server Maintenance and Service Guide</i>	This resource provides a complete list of all replacement parts available, along with step-by-step instructions on installation and replacement. Find this guide on the Compaq website at www.compaq.com/support Follow the link for maintenance and service guides, and download the guide provided for your server.

You can access information on warranties and service and support upgrades (*CarePac*[™] services) by logging on to the Internet at

www.compaq.com/services/carepac

LED Indicators, Switches, and Jumpers

This appendix describes the following features of the Compaq ProLiant ML350 Generation 2 server:

- **LEDs**

There are several LEDs located on the front, the back, and the inside of your server. These LEDs can communicate the current status of your server components and operations, thus aiding you in diagnosing the problem. You are provided with an illustration of the location of each LED on your server, as well as an explanation of uses and possible statuses in the following section.

- **Switches**

There is one switchbank in your server. Some switch settings may need to be changed from time to time and can cause problems if they are not correctly set. Some switches should not be changed for any reason. You are provided with a list of all switches, a description of what each setting means, and an illustration of where each may be found inside your server.

- **Jumpers**

When devices are added to the server, the jumpers on the device may need to be changed. You are provided with information on jumper settings.

For troubleshooting information beyond the scope of this guide, both general and specific to the ProLiant ML350 Generation 2 server, see "Other Information Resources" in Appendix D, "Troubleshooting."

LEDs

A variety of status LEDs are located on the front and back of your server. These LEDs aid you in diagnosing problems by communicating the status of the components and operations of the server. The following ProLiant ML350 Generation 2 server LEDs are explained in this appendix.

- System status LEDs (on the front of the server)
 - Power On/Standby and AC power status
 - Network Interface Controller (NIC) activity
 - Internal health
 - External health
 - Unit ID
- System board LEDs
 - Processor failure
 - PPM failure
 - Memory failure
 - Thermal failure
 - Fan failure
 - Server Feature Board seating failure
- Network controller LEDs (on the back of the server)
 - Network activity status
 - Network link
 - Connection speed

System Status LEDs

The system status LEDs and the power button are located on the front of the server.

The power button allows you to:

- Power up the server
- Place the server in standby mode
- Power down the server

See Figure E-1 and Table E-1 for an explanation of each possible LED status.

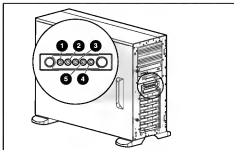


Figure E-1. System status LEDs

Table E-1
System Status LEDs

Item	Description	Status	Means
Unit ID indicator		Off	System off
		Blue	Identification
		Flashing blue	Remote console
Internal health		Off	System off
		Green	System on, AC power available.
		Amber	System degraded
		Red	System critical

continued

Table E-1
System Status LEDs *continued*

Item	Description	Status	Means
	External health	Off	System off
		Green	System on; AC power available
		Amber	System degraded (most commonly due to redundant power supply failure)
	Power On/Standby status indicator	Off	System off, no AC power.
		Green	System on, AC power available. Do not remove power from system.
		Flashing green	System in standby mode. AC power available. Do not remove power from system.
		Amber	System is off; AC power available.
	NIC indicator	Off	No connection
		Green	Linked to network
		Flashing green	System is in standby

System Board LEDs

The following LEDs are located on the system board of the ProLiant ML350 Generation 2 server and indicate when a processor, PPM, or memory module has experienced a failure.

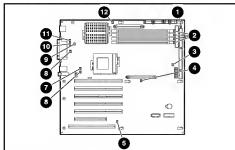


Figure E-2. System Board LEDs

Table E-2
System Board LEDs

Item	LED Description	Status
AC power		Off = No AC power, poor power supply, power supply in standby, or power supply exceeded current limits
		Green = Power supply is turned on and functioning
DIMM status		Off = DIMM functioning
		Amber = DIMM failed
Fan 2 status		Off = Normal (system in standby mode)
		Amber = System degraded

continued

Table E-2
System Board LEDs *continued*

Item	LED Description	Status
	PPM 2 status	Off = PPM 2 functioning Amber = PPM 2 failed
	Server Feature Board Sealing status	Off = Server Feature Board is installed correctly Amber = Server Feature Board is not installed correctly
	Processor 2 thermal	Off = Processor 2 temperature normal Amber = Thermal trip detected for processor 2. See Appendix C, "Server Error Messages," for appropriate instructions.
	Processor 2 status	Off = Processor 2 functioning Amber = Processor 2 failed
	System Fan status	Off = Fan is functioning Amber = Fan is not installed or has failed
	Temperature threshold	Off = Normal Amber = Temperature threshold exceeded
	Processor 1 thermal	Off = Normal Amber = Thermal trip detected for processor 1. See Appendix C, "Server Error Messages," for appropriate instructions.
	Processor 1 status	Off = Processor 1 functioning Amber = Processor 1 failed
	PPM 1 status	Off = PPM 1 functioning Amber = PPM 1 failed

Network Controller LEDs

The network controller LEDs are located on the back of the server. They provide the following information:

- If the server is linked to the network
- The speed at which the network is being accessed
- If there is current network activity

Refer to the *Compaq Servers Troubleshooting Guide* for more information on troubleshooting network controller problems.

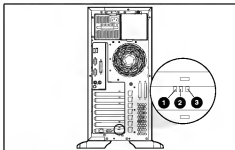


Figure E-3. Network controller LEDs

Table E-3
Network Controller LEDs

Item	LED	Status	Means
	Speed	Off	10Base-T 10-Mbps (10Base-T Ethernet)
		On	100Base-T 100-Mbps (100Base-T Ethernet)
Link	Off		No network link
	On		Linked to network
Activity	Off		No network activity
	On or flashing		Network activity

System Configuration Switch Settings

The ProLiant ML350 Generation 2 server contains one switchbank. This section explains the use of each reserved and nonreserved switch.

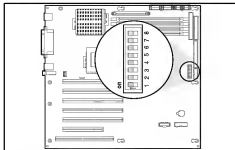


Figure E-4 System configuration switch

Table E-4
System Configuration Switch Settings

Position	Default	Function/Description
1	Off	Video disable
2	Off	Lock configuration
3	Off	Tower/Rack configuration
4	Off	Enable diskette boot
5	Off	Password disable
6	Off	Clear CMOS/NVRAM
7	Off	Reserved
8	Off	Reserved

Note: Switch positions 7 and 8 are reserved for Compaq authorized service providers only. Do not change the specified default setting for these positions, unless instructed otherwise.

Resetting System Configuration Settings

It may be necessary at some time to clear and reset system configuration settings. When the system configuration switch position 6 is set to the **on** position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM:

IMPORTANT: Clearing nonvolatile RAM (NVRAM) deletes your configuration information. Refer to Chapter 5 for complete instructions on configuring your server.

1. Power down the server.
2. Set the system configuration switch position 6 to the **on** position.
3. Power up the server.
All configuration settings are now erased and all system operations halt.
4. Power down the server.
5. Reset the position 6 switch to the default **off** position.
6. Power up the server.
7. Reset all system configuration settings.

See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide* found on your server documentation CD, for more information on RBSU.

Redundant ROM Settings

IMPORTANT: Switching ROM images can also be done through RBSU. Use the following procedures when RBSU is inaccessible. For information on accessing redundant ROM options through RBSU, see Chapter 5, "Server Configuration and Utilities."

To switch from the current ROM to the backup ROM, perform the following steps:

1. Power down the server.
2. Set the system configuration switch positions 1, 4, 5, and 6 to the **on** position.
3. Power up the server. The ROM will beep and halt when the ROM images have been swapped.
4. Power down the server and reset all system configuration switch positions to the default **off** position.
5. Power up the server.

SCSI Device Jumper Settings

No two SCSI devices connected to the same SCSI controller can have the same SCSI ID. If another SCSI device is connected to the same controller, check the SCSI ID on the device before beginning the installation procedure for the additional device. The SCSI ID is set by jumpers located on each device. For more information, refer to your SCSI device option documentation.

Appendix **F**

Specifications

This chapter provides detailed, specific information for the operation of your Compaq ProLiant ML350 Generation 2 server, including:

- Server specifications for both rack and tower models
 - Dimensions
 - Power requirements
 - Temperature requirements
- Minimum hardware configuration
- Supported operating systems
- Drivers

Server Specifications

Table F-1
Tower Server Specifications

Feature	English Units	Metric Units
Dimensions		
Height		
With feet	18.5 in	46.99 cm
Without feet	17.5 in	44.50 cm
Depth (without bezel)	24 in	60.96 cm
Depth (with bezel)	26 in	66.04 cm
Width	8.5 in	21.59 cm
Weight (No drives installed)	60 lb	27.24 kg
Input requirements		
Rated input voltage	100 VAC to 120 VAC	200 VAC to 240 VAC
Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
Rated input current	6A	3A
Rated input power	538 W	538 W
Blus per hour	1839	1839
Power supply output		
Rated steady-state power	350 W	350 W
Temperature range		
Operating	50°F to 93°F	10°C to 35°C
Shipping	-20°F to 140°F	-29°C to 60°C
Relative humidity (noncondensing)		
Operating	5% to 80%	5% to 80%
Nonoperating	5% to 90%	5% to 90%

Rack Server

Table F-2
Rack Server Specifications

Feature	English Units	Metric Units
Dimensions		
Height	8.61 in	21.87 cm
Depth	24 in	60.96 cm
Width	19.0 in	48.26 cm
Weight (no drives installed)	60 lb	27.24 kg
Input requirements		
Rated input voltage	100 VAC to 120 VAC	200 VAC to 240 VAC
Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
Rated input current	6A	3A
Rated input power	538 W	538 W
BTUs per hour	1839	1839
Power supply output power		
Rated steady-state power	350 W	350 W
Temperature range		
Operating	41°F to 122°F	5°C to 50°C
Shipping	-18°F to 185°F	-40°C to 85°C
Relative humidity (noncondensing)		
Operating	5% to 95%	5% to 95%
Nonoperating	5% to 95%	5% to 95%
Wet bulb temperature		
Maximum	101.7°F	38.7°C

Minimum Hardware Configuration

Make sure that your server meets the requirements for minimum hardware configuration. During the troubleshooting process, it may be necessary to reduce your system to its minimum configuration, reinstalling options one at a time to determine the cause of failure.

Table F-3
Minimum Hardware Configuration

Component	Minimum Specification
Processors	A processor must be installed in a processor socket.
Server Feature Board	The Server Feature Board is installed in a dedicated expansion slot.
Fans	A system fan must be installed and connected to the system board.
Memory	At least one slot must be populated with an ECC 133-MHz Registered SDRAM DIMM.
PPM	A PPM must be inserted into the PPM slot.

Also refer to the *Compaq ProLiant ML350 Generation 2 Server Maintenance and Service Guide* at the Compaq website:

www.compaq.com/support

Supported Operating Systems

To operate properly, your server must have a supported operating system.



CAUTION: If your server has a factory-installed operating system, configure the server using the instructions in the *Compaq Factory-Installed Operating System Software Installation Guide* or data will be lost.

For updated information on supported operating systems for the ProLiant ML350 Generation 2 server, log on to the Internet at the following website:

www.compaq.com/products/servers/platforms

or download a spreadsheet of supported operating systems for Compaq servers at the following ftp site:

<ftp://ftp.compaq.com/pub/products/servers/os-support-matrix-310.pdf>

For the latest information on Linux version and support, log on to the Internet at the following website:

www.compaq.com/products/servers/linux.html

Drivers

The ProLiant ML350 Generation 2 server features new hardware that does not have driver support on all operating system installation media. It is recommended that you use SmartStart and its Assisted Path feature to install your operating system and the latest driver support. If you do not use SmartStart to install your operating system, drivers for some of the new hardware must be downloaded and installed. These drivers, as well as other options drivers, ROM images, and value-add software can be downloaded from the following website:

www.compaq.com/support/files/server

For more information on drivers, refer to "Maintaining Current Drivers" in the *Compaq Servers Troubleshooting Guide*.

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